

## Catalyst 3512 XL and 3524 XL Stackable 10/100 and Gigabit Ethernet Switches

THE CATALYST® 3512 XL AND CATALYST 3524 XL SWITCHES ARE MEMBERS OF THE CISCO SYSTEMS CATALYST 3500 SERIES XL, A SCALABLE LINE OF STACKABLE 10/100 AND GIGABIT ETHERNET SWITCHES THAT DELIVERS PREMIUM PERFORMANCE, MANAGEABILITY, AND FLEXIBILITY WITH UNPARALLELED INVESTMENT PROTECTION. WITH A 10-Gbps SWITCHING FABRIC AND A MAXIMUM 6.5-MILLION-PACKET-PER SECOND, WIRE-SPEED FORWARDING RATE, THESE SWITCHES ARE IDEAL FOR CREATING HIGH-PERFORMANCE LOCAL-AREA NETWORKS.

The Catalyst 3512 XL switch has 12 10/100 switched ports and two Gigabit Interface Converter (GBIC)-based Gigabit Ethernet ports, and the Catalyst 3524 XL has 24 10/100 ports and two GBIC-based Gigabit Ethernet ports. The built-in Gigabit Ethernet ports accommodate a range of GBIC transceivers, including the Cisco GigaStack™ GBIC, and 1000BaseSX and 1000BaseLX/LH GBICs.

The Catalyst 3512 XL and Catalyst 3524 XL are ideal for desktop connectivity and aggregating a group of Catalyst 2900 series XL or Catalyst 1900 switches. The 12-port Catalyst 3512 XL offers low port density at a low entry price. The 24-port Catalyst 3524 XL delivers dedicated 10- or 100-Mbps bandwidth to individual users and servers at the lowest per port price. The switches' dual GBIC-based Gigabit Ethernet ports provide an ultra-flexible and scalable solution for Gigabit Ethernet uplinks or GigaStack GBIC stacking solutions. Available in Standard and Enterprise Editions, the Catalyst 3512 XL and Catalyst 3524 XL switches are software upgradable, so your investment is protected and your LAN can grow and evolve with your network requirements. The switches are easy to deploy, either on a desktop or in a wiring closet, and feature Cisco IOS® software support.

The Catalyst 3512 XL and Catalyst 3524 XL are autosensing 10/100 switches for creating high-performance LANs. Available in Standard and Enterprise Editions, the switches provide 12 or 24 10/100 ports and two built-in GBIC-based Gigabit Ethernet ports with wire-speed performance on all ports



### New Cisco Scalable Stacking Architecture

Cisco Systems, the leader in internetworking solutions, provides the industry's most flexible, scalable, and manageable stacking architecture for Catalyst 3500 series XL and gigabit-enabled Catalyst 2900 series XL switches.

#### Flexible Stacking

The Catalyst 3500 series XL and gigabit-enabled Catalyst 2900 series XL switches can be stacked using the low-cost Cisco GigaStack GBIC. The two-port GigaStack GBIC offers a range of highly configurable stacking and performance options by delivering 1-Gbps connectivity in a daisy-chained connection or up to 2-Gbps full-duplex connectivity in a dedicated, switch-to-switch connection.

### **Cisco Switch Clustering**

Cisco takes stacking to a new level with its new Switch Clustering technology. This breakthrough technology enables up to 16 interconnected Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches, regardless of geographic proximity, to form a single-IP managed network. These switches can be clustered using a broad range of connectivity options to deliver various levels of performance to meet customer requirements. Clustering connectivity options for the Catalyst 3512 XL and Catalyst 3524 XL include Ethernet, Fast Ethernet, Fast EtherChannel®, low-cost Cisco GigaStack GBIC, Gigabit Ethernet, and Gigabit EtherChannel. Because customers are not limited by proprietary stacking modules and stacking cables, Cisco Switch Clustering technology expands the traditional stacking domain beyond a single wiring closet and lets users “mix and match” interconnections to meet specific management, performance, and cost requirements.

Catalyst 3500 XL switches can be configured either as command or member switches in a Cisco switch stack or cluster. The command switch serves as the single IP address management point and disburses all management instructions dictated by the network administrator. Command switches can cluster up to 15 additional interconnected member switches regardless of interconnection media.

### **Web-Based Switch Management:**

#### **Cisco Visual Switch Manager**

The Catalyst 3512 XL and 3524 XL feature the Cisco Web-based management tool, Cisco Visual Switch Manager (CVSM), which allows network administrators to view and manage the switch from anywhere on the network through a standard browser such as Microsoft Internet Explorer or Netscape Navigator. CVSM is launched from the switch itself, and delivers simple network- and device-level management, including port configuration, virtual LAN (VLAN) setup, network views, and port monitoring. CVSM is an integral part of the Cisco scalable stacking architecture, allowing users to easily configure and manage stacks and switch clusters and to administer software upgrades across multiple switches.

### **Standard Edition Software**

Cisco Catalyst 3500 series XL Standard Edition switches include several exceptional features to increase network performance, manageability and security. The command switch feature delivers single-IP managed Cisco Switch Clustering technology to up to 16 interconnected Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches. Fast EtherChannel and Gigabit EtherChannel technology offer from 400-Mbps to 4-Gbps high-performance bandwidth among Catalyst switches, routers, and servers. Cisco Group Management Protocol (CGMP) enhances performance of multimedia applications and reduces network traffic by allowing a switch to selectively and dynamically forward IP multicast traffic to targeted end stations. Up to 250 port-based VLANs per switch allow data packets to be forwarded only to stations within a specific VLAN, creating a virtual firewall between groups of ports on the network. Network Time Protocol (NTP) provides a unified clock across the network, ensuring accurate time stamps for troubleshooting all network events. Media Access Control (MAC)-based port level security prevents unauthorized stations from accessing the switch. Multi-layer security on the switch console prevents unauthorized users from gaining access and altering the switch configuration. All Standard Edition switches can be upgraded with the purchase of an optional Enterprise Edition upgrade kit.

### **Enterprise Edition Software**

Enterprise Edition software includes all of the features of the Standard Edition and adds enhanced end-to-end VLAN support to your Catalyst 3500 series XL switch. Virtual LAN trunks can be created from any port using either 802.1Q trunking or the Cisco Inter-Switch Link (ISL) VLAN architecture. VLANs using standards-based 802.1Q and ISL trunking provide broadcast control and enhanced security, and simplify adds, moves and changes. TACACS+ authentication enables centralized access control of the switch and restricts unauthorized users from altering the configuration. Uplink Fast technology ensures quick failover recovery, enhancing overall network stability and reliability. An Enterprise Edition switch is the best choice in a network that requires higher-level security, superior fail-safe redundancy, and end-to-end VLANs spanning multiple routers, chassis switches, and access servers.

## Key Features/Benefits

### Exceptional Performance

- Twelve or 24 wire-speed 10BaseT/100BaseTX autosensing ports, each delivering up to 200 Mbps of bandwidth to individual users, servers, or workgroups to support bandwidth-intensive applications
- Two built-in, wire-speed GBIC-based Gigabit Ethernet ports, delivering up to 4-Gbps aggregated bandwidth to Gigabit Ethernet backbones, or Gigabit Ethernet servers, or between switches
- 10-Gbps switching fabric and up to 6.5 million packets-per-second forwarding rate, ensuring full-wire speed operation for each 10BaseT/100BaseTX and Gigabit Ethernet port
- 4-MB shared memory architecture, ensures the highest-possible throughput with a design that eliminates head-of-line blocking, minimizes packet loss, and delivers better overall performance in environments with extensive multicast and broadcast traffic
- Full-duplex operation on all ports, delivering up to 200 Mbps on 10/100 ports or 2 Gbps on 1000BaseX ports
- 8-MB DRAM and 4-MB Flash memory onboard, enabling the addition of a continuous stream of feature upgrades, maximizing customers' investments
- Dual priority forwarding queues on each 10/100 port and eight priority forwarding queues on all Gigabit Ethernet ports, enabling network traffic prioritization and seamless data, voice, and video integration (enabled in future software)
- Bandwidth aggregation through Fast EtherChannel and Gigabit EtherChannel technology, enhancing fault tolerance and offering from 400 Mbps up to 4 Gbps of aggregated bandwidth between switches, and to routers and individual servers
- Configurable network port, supporting unlimited MAC addresses for backbone connectivity

### Flexible and Scalable Switch Clustering and Stacking

- GigaStack GBIC delivers a low-cost, independent stack bus with a 1-Gbps forwarding bandwidth in a daisy-chain configuration, with up to nine Catalyst 3500 XL or gigabit-enabled Catalyst 2900 series XL switches or a 2-Gbps forwarding rate in a point-to-point configuration
- Cisco switch clustering technology allows a user to manage up to 16 inter-connected Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches through a single IP address regardless of location
- GBIC-based Gigabit Ethernet ports give customers a choice of 1000BaseSX, 1000BaseLX/LH, or Cisco GigaStack stacking GBICs to fit their connection needs

### Ease of Use and Ease of Deployment

- Cluster software upgrade feature allows the network manager to quickly and easily upgrade the system software on a group of Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches
- IEEE 802.3z-compliant 1000BaseSX and 1000BaseLX/LH physical interface support through a field-replaceable GBIC module provides customers unprecedented flexibility in switch deployment
- Autosensing on each port detects attached device speed and automatically configures the port for 10- or 100-Mbps operation, easing the deployment of the switch in mixed 10BaseT and 100BaseTX environments
- Autonegotiating on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth
- Autoconfiguration eases deployment of switches in the network by automatically configuring multiple switches across a network via a boot server
- Default configuration stored in Flash memory ensures that a switch can be quickly connected to the network and can pass traffic with minimal user intervention, preserving configuration in case of a power outage

#### **Integrated Cisco IOS Switching Solution**

- Cisco Group Management Protocol (CGMP) enables a switch to selectively and dynamically forward routed IP multicast traffic to targeted multimedia end stations, reducing overall network traffic
- CGMP Fast Leave allows end stations to quickly exit from a multicast session, reducing superfluous network traffic
- Virtual LAN trunks can be created from any port using either standards-based 802.1Q tagging or the Cisco ISL VLAN architecture
- IEEE 802.1p Layer 2 prioritization protocol ready, allowing users to assign data packets to prioritized forwarding queues
- Cisco Virtual Trunking Protocol (VTP) supports dynamic VLANs and trunk configuration across all switches
- Per-port broadcast storm control prevents faulty end stations from degrading overall system performance with broadcast storms
- Command-line interface (CLI) support provides common user interface and command set across all Catalyst series switches and Cisco routers

#### **Superior Manageability**

- Built-in Web-based Cisco Visual Switch Manager (CVSM) provides easy-to-use Web-based management interface through a standard browser such as Netscape Navigator or Microsoft Explorer
- Simple Network Management Protocol (SNMP) and Telnet interface support deliver comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management
- Manageable through CiscoWorks 2000 network management software on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs
- Cisco Discovery Protocol (CDP) enables a CiscoWorks network management station to automatically discover a switch in a network topology
- Embedded Remote Monitoring (RMON) software agent supports four RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis

- Support for all nine RMON groups through use of a switch port analyzer (SPAN) port, which permits traffic monitoring of a single port, a group of ports, or the entire switch from a single network analyzer or RMON probe
- Domain Name Services (DNS) client support provides IP address resolution with user-defined device names
- Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by downloading from a centralized location
- Network Time Protocol (NTP) provides an accurate and consistent timestamp to all switches within the intranet
- Multifunction LEDs per port for port status, half-duplex/full-duplex, and 10BaseT/100BaseTX indication, as well as switch-level status LEDs for system, RPS, and bandwidth utilization provide a comprehensive and convenient visual management system

#### **Security and Redundancy**

- Cisco Uplink Fast technology ensures quick failover recovery, enhancing overall network stability and reliability (Enterprise Edition only)
- Support for TACACS+ authentication enables centralized control of the switch and restricts unauthorized users from altering the configuration (Enterprise Edition only)
- MAC-based port level security prevents unauthorized stations from accessing the switch
- User-selectable address learning mode simplifies configuration and enhances security
- Multilevel security on console access prevents unauthorized users from altering the switch configuration
- IEEE 802.1D Spanning-Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance
- Support for redundant loopback connection through secondary GigaStack GBICs in top and bottom switches in a stack
- Support for optional Cisco 600-watt redundant AC power system provides a backup power source for up to four units for improved fault tolerance and network uptime

## Technical Specifications

### Performance

- 10-Gbps switching fabric
- 4.8 million PPS wire-speed forwarding rate for 64-byte packets (Catalyst 3512 XL), 6.5 million PPS wire-speed forwarding rate for 64-byte packets (Catalyst 3524 XL)
- 5 Gbps maximum forwarding bandwidth
- 4-MB memory architecture shared by all ports
- Packet forwarding rate for 64-byte packets:
  - 14,880 PPS to 10-Mbps ports
  - 148,800 PPS to 100BaseT ports
  - 1,488,000 PPS to 1000BaseX ports
- 8-MB DRAM and 4-MB Flash memory
- 8192 MAC addresses

### Management

- SNMP Management Information Base (MIB) II, SNMP MIB extensions, Bridging MIB (RFC 1493)

### Standards

- IEEE 802.3x full duplex on 10BaseT, 100BaseTX, and 1000BaseX ports
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.1Q VLAN
- IEEE 802.3z 1000BaseX specification
- 1000BaseX (GBIC)
  - 1000BaseSX
  - 1000BaseLX/LH
- IEEE 802.3u 100BaseTX specification
- IEEE 802.3 10BaseT specification

### Y2K

- Y2K compliant

### Connectors and Cabling

- 10BaseT ports: RJ-45 connectors; two-pair category 3, 4, or 5 unshielded twisted-pair (UTP) cabling
- 100BaseTX ports: RJ-45 connectors; two-pair Category 5 UTP cabling
- 1000BaseX GBIC ports: SC fiber connectors, single mode or multimode fiber
- GigaStack GBIC ports: copper-based Cisco GigaStack cabling
- Management console port: RJ-45 connector, RS-232 serial cabling

### Indicators

- Per-port status LEDs—link integrity, disabled, activity, speed, and full-duplex indications
- System status LEDs—system, RPS, and bandwidth utilization indications

### Dimensions and Weight (H x W x D)

- 1.75 x 17.5 x 11.8 in (4.4 x 44.5 x 30 cm)
- One rack high
- 10.25 lb (4.6 kg)

### Environmental Conditions and Power Requirements

- Operating temperature: 32 to 113 F (0 to 45 C)
- Storage temperature: -4 to 149 F (-20 to 65 C)
- Operating relative humidity: 10 to 85% noncondensing
- Operating altitude: Up to 10,000 ft (3000 m)
- Power consumption: 70W maximum; 239 BTU per hour
- AC input voltage/frequency: 100 to 120/200 to 240 VAC (autoranging) 50 to 60 Hz
- MTBF 150,000 hours

### Safety Certifications

- UL 1950
- CSA 22.2 No. 950
- EN 60950
- IEC 950
- AS/NZS 3260, TS001
- CE

### Electromagnetic Emissions Certifications

- FCC Part 15 Class A
- EN 55022B Class A (CISPR 22 Class A)
- VCCI Class A
- AS/NZS 3548 Class A
- BCIQ
- CE Marking

### Warranty

- Lifetime limited warranty



## Ordering Information

### Model Numbers

- WS-C3512-XL-A (12-port 10/100 + two-port 1000BaseX, Standard Edition)
- WS-C3512-XL-EN (12-port 10/100 + two-port 1000BaseX, Enterprise Edition)
- WS-C3524-XL-A (24-port 10/100 + two-port 1000BaseX, Standard Edition)
- WS-C3524-XL-EN (24-port 10/100 + two-port 1000BaseX, Enterprise Edition)

### For More Information on Cisco Products, Contact:

- U. S. and Canada: 800 553-NETS (6387)
- Europe: 32 2 778 4242
- Australia: 612 9935 4107
- Other: 408 526-7209
- World Wide Web URL: <http://www.cisco.com>



#### Corporate Headquarters

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 526-4100

#### European Headquarters

Cisco Systems Europe s.a.r.l.  
Parc Evolic, Batiment L1/L2  
16 Avenue du Quebec  
Villebon, BP 706  
91961 Courtaboeuf Cedex  
France  
<http://www-europe.cisco.com>  
Tel: 33 1 69 18 61 00  
Fax: 33 1 69 28 83 26

#### Americas Headquarters

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-7660  
Fax: 408 527-0883

#### Asia Headquarters

Nihon Cisco Systems K.K.  
Fuji Building, 9th Floor  
3-2-3 Marunouchi  
Chiyoda-ku, Tokyo 100  
Japan  
<http://www.cisco.com>  
Tel: 81 3 5219 6250  
Fax: 81 3 5219 6001

**Cisco Systems has more than 200 offices in the following countries. Addresses, phone numbers, and fax numbers are listed on the Cisco Connection Online Web site at <http://www.cisco.com/offices>.**

Argentina • Australia • Austria • Belgium • Brazil • Canada • Chile • China • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE  
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